Citation:

Cappuccio FP, MacGregor GA. Does potassium supplementation lower blood pressure? A meta-analysis of published trials. *J Hypertens*. 1991 May; 9 (5): 465-473.

PubMed ID: 1649867

Study Design:

Meta-analysis

Class:

M - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To evaluate the effect of oral potassium supplementation on blood pressure by pooling the results of published clinical trials.

Inclusion Criteria:

Papers on clinical trials published between 1980 and 1989 investigating the effect of oral potassium supplementation on blood pressure.

Exclusion Criteria:

- Trials with data on blood pressure changes that were not available
- Trials with end-points other than blood pressure fall that were studied
- Trials that compared potassium deprivation with normal intake.

Description of Study Protocol:

Recruitment

Trials were identified by reviewing reference lists in relevant papers and conducting manual (Current Contents and Index Medicus) and computer (Medline and ICI) searches of articles published between 1980 and 1989.

Design

Meta-analysis.

Intervention

Potassium supplementation.

Statistical Analysis

- The difference in blood pressure between control and potassium supplemented groups in each study were calculated
- The results from each study were also weighted by the inverse of the variance and the pooled mean treatment effect was calculated
- Weighted linear regression was used to calculated weighted slopes by weighting inversely as to the residual variances.

Data Collection Summary:

Pooled analysis of study results.

Description of Actual Data Sample:

- *Attrition (final N):* 19 RCTs
  - 586 subjects given oral potassium supplementation
  - 240 subjects in control groups
- *Age:* Mean age of 39.6 years
- *Ethnicity:* Approximately 69% White
- *Other relevant demographics:* 76% males
- *Anthropometrics:* Mean baseline blood pressure in the pooled sample was 140/87mmHg.

Summary of Results:

Key Findings

- The pooled estimate of the treatment effect of potassium supplementation on supine blood pressure (95% confidence interval) was -5.9 (-6.6, -5.2) for systolic blood pressure and -3.4 (-4.0, -2.8) for diastolic blood pressure
- Considering hypertensives only, the pooled estimate of the treatment effect of potassium supplementation on supine blood pressure (95% confidence interval) was -8.2 (-9.1, -7.3) for systolic blood pressure and -4.5 (-5.2, -3.8) for diastolic blood pressure.

Other Findings

- The size of the pooled estimate of the blood pressure lowering effect of potassium was not different when only randomized placebo-controlled trials were considered
- For systolic blood pressure, the response to potassium tended to be greater the higher the initial blood pressure ($P<0.01$ for slope)
- Weighted regression analysis showed a significant association between blood pressure fall and longer duration of potassium treatment.

Author Conclusion:

Oral potassium supplementation produces a small, but statistically and clinically significant reduction in blood pressure, and a greater reduction in patients with high blood pressure.

Reviewer Comments:

Study Strengths

- *Clinical relevance of the pooled effect size is discussed*
- *Individual study characteristics clearly detailed in tables*
- *Subgroup analysis was conducted (hypertensive subjects, study design, pre-treatment blood pressure, duration of treatment).*

Study Limitations

- *Description of search strategy was not detailed, the number of articles screened not mentioned*
- *Publication bias and potential bias in individual studies was not discussed.*

Research Design and Implementation Criteria Checklist: Review Articles

Relevance Questions		
1.	Will the answer if true, have a direct bearing on the health of patients?	Yes
2.	Is the outcome or topic something that patients/clients/population groups would care about?	Yes
3.	Is the problem addressed in the review one that is relevant to nutrition or dietetics practice?	Yes
4.	Will the information, if true, require a change in practice?	Yes

Validity Questions		
1.	Was the question for the review clearly focused and appropriate?	Yes
2.	Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search termsused described?	???
3.	Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased?	Yes
4.	Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible?	No
5.	Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined?	Yes
6.	Was the outcome of interest clearly indicated? Were other potential harms and benefits considered?	Yes

7.	Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issued considered? If data from studies were aggregated for meta-analysis, was the procedure described?	Yes
8.	Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included?	Yes
9.	Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed?	Yes
10.	Was bias due to the review's funding or sponsorship unlikely?	Yes